

Instructional Design in LIS Education: Preparing for New Educational Roles in an Interconnected World

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ABSTRACT

As information professionals connect with and educate their patrons in new ways, instructional design takes a more prominent role in the careers of those working in library and information sciences. Despite this growing need, some MLIS programs do not have courses that emphasize instructional design competencies. This paper describes the development of an Instructional Design course in an MLIS program, and details how the course content is aligned with instructional design competencies. Preliminary feedback from students is also shared. This paper provides a justification and model for the development of an instructional design course in other MLIS programs.

ALISE RESEARCH TAXONOMY TOPICS

curriculum; pedagogy; online learning

AUTHOR KEYWORDS

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INTRODUCTION

As the librarian's instructional role online expands, the demand for information professionals who have instructional design (ID) competencies also increases. In a search of the ALA Joblist over two days in February and March of 2020, fifteen current positions, all in academic libraries, mentioned instructional design competencies, with several including a preference for ID coursework or experience. In addition, at least fifteen other postings included competencies in the job duties and requirements that could fall under instructional design, and these included positions in not just academic libraries, but in school and public libraries as well. Noteworthy, though, is that in a content analysis of the course offerings of the 62 ALA-accredited Master's programs in LIS, only nine programs appeared to offer a course that focuses on or includes instructional design. Given the overlap between competencies in ID and many librarians' job duties (Nichols Hess & Greer, 2016; Turner, 2016), integrating instructional design into the MLIS curriculum will ensure that our graduates are prepared for the online instructional roles they will take on in their careers. Both of the authors have seen the need for

these competencies and, one by designing the course and the other by taking the course as a MLIS student, believe that the integration of an instructional design course into an MLIS curriculum will increase the value of higher education for librarians, and ensure information professionals have adaptable skills to maintain relevance as online instruction grows.

INTRODUCTION TO INSTRUCTIONAL DESIGN

Instructional design is the systematic method of using pedagogical techniques and learning theory to create instructional content and learning environments (Seel, Lehmann, Blumschein, & Podolski, 2017). Instructional design's genesis can be traced to the development of military training, and most of ID's focus now is on professional training (Seel, 1989), but it can be used in a variety of different settings, including to create tutorials, courses, and curricula. Instructional design is typically used to develop content that exists online, but that is not its sole function, as the principles of ID can be used to plan any sort of instructional content or learning environments.

There are several models used in instructional design, but the most well-known model is ADDIE, which stands for Analyze, Design, Develop, Implement, and Evaluate. In the Analyze phase, instructional designers attempt to understand the instructional need, understand the characteristics of their learners, and examine the context of the learning environment, like what technology is at hand, what ability and knowledge instructors have, and if learners will be able to access online content. The next phase of ADDIE is the Design phase. Here, instructional designers develop learning objectives based on the information gathered during the Analyze phase. They also consider how learners would demonstrate that they have accomplished the learning objectives, be it a test, a project, or a demonstration. Then, designers determine what sort of instruction, given the constraints of the learning environment and the characteristics of the learners, would best meet learner needs. In the Develop phase, instructional designers engage in the process of creating materials or selecting materials to be included in the learning environment. The fourth phase of ADDIE is the Implement phase, where the instructional content is launched. The last phase, Evaluate, asks instructional designers to engage in assessment at several levels: the quality of instruction (if applicable), student learning, and the quality of the instructional content. With the information gathered from evaluation, the process can begin again with the goal of revising instructional content and delivery mechanisms, and to make improvements in instructional facilitation.

Other ID models, like the Kemp Model, the Dick-Carey Model, and the SAM Model, are very similar to ADDIE, typically beginning with understanding the learners, developing objectives, designing content, and evaluating learning success. The Kemp Model differs in its emphasis on project management and planning and revision throughout the process. The Dick-Carey Model has detailed steps within each phase. The SAM Model includes rapid-prototyping

throughout the phases. Because of the similarities among all of the models, some see ADDIE as more of a framework than a model (Bichelmeyer, 2005).

Some instructional designers argue that ADDIE is too rigid and does not reflect the actual process of instructional design (Allen & Sites, 2012; Jung, Kim, Lee, & Shin, 2019). However, ADDIE can work as an iterative process rather than a waterfall approach, with evaluation occurring throughout the Design and Development stages, integrating improvements throughout the process (Nichols Hess & Greer, 2016). More pointedly, though, critical instructional design argues that we need to think more deeply about questions of how to reach students, engage in discussions, and encourage relationships, and that ADDIE or any other ID model does not address this (Morris, 2017).

Ultimately, though, instructional design provides a framework for strategic thinking and brainstorming to address an instructional opportunity. This is at the heart of what many librarians do when trying to create instructional interventions to meet the many needs of their patrons, and yet is not always included in MLIS curricula. Even if it is covered in a course focused on instruction, this course likely does not provide the breadth and depth of information about ID that will be necessary for many of our students when they are asked to create online modules, tutorials, instructional videos, and webinars as part of their professional duties.

ID CURRICULUM IN AN LIS PROGRAM

While many LIS programs have a course that addresses teaching and learning or information literacy instruction, including at the authors' institution, most do not have a course dedicated to instructional design. We cannot ask MLIS students to be expert instructional designers, but a course in instructional design allows them to understand the process and competencies that come with creating online and/or technology-enhanced education. Turner (2016) argues that ID should be integrated into core courses. At Pitt, we have integrated design thinking, which has many similarities to instructional design, into our core courses, but instructional design remains an elective.

To develop the course, one of the authors, who has a doctorate in instructional technology, used an iterative version of the ADDIE method herself to develop an asynchronous, online course. This process began with an examination of several job postings that mentioned instructional design. The author had hired an Instructional Design Librarian at her previous institution, so she understood what was required of librarians with instructional design duties. She had previously attended the Distance Library Services conference and had read about "blended librarianship," the concept proposed by Bell and Shank (2007), who state that a blended librarian "combines the traditional skill set of librarianship with the information technologist's hardware/software skills, and the instructional or educational designer's ability to apply technology appropriately in the teaching-learning process" (p. 373). All of this, including

the author's expertise and experience with creating online learning opportunities in an academic library, helped to establish the need and justification for the course.

The course learning outcomes reflect the phases typical of instructional design (Table 1). The major assignments include a literature review of a learning theory, a design project that is scaffolded throughout the class, quizzes, and weekly discussion board postings. Each week, short video lectures created by the instructor are provided, along with readings, additional videos, discussion questions, and other supplemental activities, like formative quizzes and peer review. Weekly lessons cover topics like analyzing learner needs, developing instructional goals and objectives, introductions to various ID models, inclusive instruction online, Universal Design, and learner assessment. The course itself uses Universal Design principles through multiple representations of the materials (visual, audio, text), allowing students to respond in the discussion boards via audio, video, or text, and allowing students to choose topics for the major project.

Learning Outcomes	Assessments
<ul style="list-style-type: none"> • Identify the purpose of instructional design • Compare ID models and choose the most appropriate model for a learning scenario 	<ul style="list-style-type: none"> • Course discussions • Quizzes, final design plan
<ul style="list-style-type: none"> • Analyze learner needs to identify gaps and plan instructional goals • Design effective, brain-based learning activities • Develop formative and summative assessment to determine the effectiveness of instruction 	<ul style="list-style-type: none"> • Needs analysis • Literature review, Storyboard, and final design plan • Storyboard and final design plan
<ul style="list-style-type: none"> • Evaluate educational technology based on ability to meet instructional needs 	<ul style="list-style-type: none"> • Final design plan

Table 1: LOs and Assessments

The major project of the course is split into three components: a needs analysis, a storyboard, and a final design, all to create an instructional module on the topic of the students' choosing. The needs analysis has students develop a plan for how they would better understand learners through data collection and analysis, and then asks them to establish goals and learning objectives for their module. The storyboard asks students to draft an instructional video or animation, and then the instructor and peers provide feedback on this prototype. The last step is the final module design plan, which includes a high-fidelity version of the video students storyboarded, instructional activities, and a formative and summative assessment plan. All the steps in designing and developing the module emulate the real-world process of instructional design to prepare students for the brainstorming, data collecting, planning, and iterating that is part of developing instructional material for libraries, museums, and archives.

Students who complete the Instructional Design course should have an understanding of how to apply evidence-based learning theories, ID models, educational technology, strategies to increase inclusivity and community online, and instructional evaluation and assessment (and the limitations and ethical concerns of methods of assessment, like the privacy violations of learning analytics) to their areas of interest and expertise in LIS. While, as Turner (2016) states, not all of the competencies for Instructional Design from the International Board of Standards, Training, Performance, and Instruction (ibstpi) (Koszalka, Russ-Eft, Reiser, Senior Canela, Hopkins Grabowski, & Wallington, 2013) are necessary for librarians, many of them fit into other competencies, like those of ALA, for information professionals. Below, we detail how the course meets the ibstpi competencies that were highlighted by Turner (2016) as being important for information professionals.

Communicate effectively in visual, oral, and written form: These are not skills unique to instructional design, but within the course, students complete a literature review exploring the empirical literature relevant to a learning theory. They also respond nearly every week in the discussion board, post video introductions, and create a storyboard that is developed into a high-fidelity version of an instructional video.

Identify and describe target population and environmental characteristics; Select and use analysis techniques for determining instructional content: Students complete a plan for a needs analysis, where they describe the audience for the learning module they will create, and they describe the context and situations that have precipitated the opportunity for an instructional intervention. Within the needs analysis, students also develop a plan to better understand the learning needs of the audience. Strategies for reaching audiences with different backgrounds and interests are explored as well.

Analyze the characteristics of existing and emerging technologies and their potential use: Cognitive load and multimedia learning are explored in the course, which allow students to evaluate how instructional technology may help or hinder learning. Additionally, several

modules of the course include exploration of possible tools, like Learning Management Systems, quizzing software, and screencasting tools.

Use an instructional design and development process appropriate for a given project: After being introduced to various instructional design models, students choose one to use in the planning of their learning module design. While the focus of the course is mostly on an ADDIE approach to instructional design, students may adopt other models and methods appropriate for their specific instructional scenario.

Organize instructional programs and/or products to be designed, developed, and evaluated: A lesson in the course is dedicated to the organization of instruction in online environments. A variety of organizational methods are introduced, like Gagne's Nine Events of Instruction, the Gradual Release Model, and Dale's Cone of Experiences. Students in their learning module plan provide an organizational structure for the module, along with a rationale for the organization.

Design instructional interventions: The learning module plan is a design of the instructional intervention that will meet the instructional needs and learning goals and objectives identified in the needs analysis. While students are not required to completely develop all aspects of the module, they are required to include a detailed plan. They also explore techniques to make online learning more inclusive.

Select or modify existing instructional materials: Within the plan for the learning module, students may identify existing content or modify content either in the activities chosen or the presentation of information. Resources like PRIMO, Merlot, and OER repositories are introduced to students and available to be included in the learning module plan.

Develop specifications that serve as the basis for media production: Students describe what type of media will be used in their learning module, including where the module will be hosted (LMS, LibGuide, etc.). Determining this environment, the audience, and the instructional allows them to choose the type of media that will be required to meet the learning objectives to align the interventions, objectives, and assessment.

Revise instructional and noninstructional solutions based on data: Within the course, both assessment of student learning and evaluation of instructional interventions are examined. Discussions of assessment and evaluation include implications for revision of the content and structure of the instruction.

STUDENT FEEDBACK

Mid-semester feedback indicated overall that students were satisfied with the course, with several students mentioning surprise at the quality of the online learning environment or appreciation of the course thus far. Students in a face-to-face meeting said they were glad to have been "forced" to take an online course that was well-designed since it provided an example for

them for the possibilities for online learning. End-of-term student evaluations indicated high satisfaction with the course, with the overall instruction being rated a 4.89 out of 5. In addition, one author, a student in the course, applied knowledge gained about evidence-based learning theories in her work as a library assistant at a Pittsburgh-area public library. After writing in her monthly report about how she used knowledge of cognitive load theory and encoding to structure a brief “share-out” about a training she went to the previous year at a staff meeting, her manager commented that she appreciated that the author was able to use her work in graduate school to improve job performance.

STUDENT ASSESSMENT

Students were able to use real-world situations in the needs analysis, storyboard, and final module design. Topics range from instructing Doctor of Nurse Practitioner students on how to use online databases to teaching genealogical researchers how to use archival materials. Students are using these assignments to identify authentic applications for instructional design techniques, many of which relate to their current internships or experiential learning in other courses.

Each assignment was evaluated with a rubric, and student performance overall on all assignments indicated high student achievement. For the literature review, the rubric evaluated organization, the comprehensiveness of the sources, the quality of the analysis, and writing style; the average was 91%. The rubric for the needs analysis included a clear description of the need, a description of the audience and clear sampling measure, quality instruments and/or protocols, a solid data analysis plan, and then measurable goals and objectives; the average for this assignment was 95%. The storyboard assignment was graded based on a thorough background of the instructional scenario, clear learning objectives for the storyboard, direct instruction that facilitated learning, and an effective assessment plan; the average grade for this assignment was 96%. For the final module plan, students were graded on justifying the ID model used, providing a background to the instructional scenario; having clear learning objectives for the module; having a developed prototype with multimedia instruction; creating multiple, effective instructional activities; having clear assessments; and creating a quality product. The average grade for the final assignment was 96%.

ANTICIPATED CHANGES

While student feedback and performance indicated overall success, changes to the course will be made. It is clear that anti-racist instruction must be integrated into every course; considering critical instructional design, who is excluded by the ID approach, and what assumptions are made about learners, their abilities, and their background must be considered in both the design of the course and the way in which ID is presented in the course content. While

issues of diversity and inclusion were addressed in the first iteration, the role of white supremacy in instructional design was not explicitly addressed or challenged. Future iterations of the course will integrate these critiques more fully. With the impacts of the digital divide and online education very apparent during COVID-19, the course will also address how instructional designers can create effective online instruction while keeping issues of equity and access in mind.

THE FUTURE OF ID IN LIS

MLIS programs may not be able to make Instructional Design a core course, but offering it as an elective, either through a partnership with the School of Education or through the development of a course offered within the program, will allow those students who anticipate that they will be engaged in the development of training and instruction, particularly online, to learn the necessary instructional designer competencies highlighted by Turner (2016). For programs that have a course on instruction, while a section within the course on instructional design is useful, it is unlikely to cover all the ID competencies, and therefore may not prepare students for library careers that strongly emphasize instructional design.

Instructional design will continue to be a major element of many librarians' job duties, especially in a post-COVID world, and we must adequately prepare students for the expectations of designing creative and engaging instruction for interconnected online and digital environments. Within libraries, we will see increased use of augmented reality, virtual reality, and other new tools, and librarians need to understand the process of how to plan, design, execute, and assess learning that integrates new technologies and reaches user groups in new ways. Through an instructional design course in our MLIS programs, we can ensure that our graduates can respond to these developments in agile but strategic ways.

REFERENCES

- Allen, M., & Sites, R. (2012). *Leaving ADDIE for SAM: An agile model for developing the best learning experiences*. American Society for Training and Development.
- Bell, S. J., & Shank, J. D. (2007). *Academic librarianship by design: A blended librarian's guide to the tools and techniques*. American Library Association.
- Jung, H., Kim, Y., Lee, H., & Shin, Y. (2019). Advanced instructional design for successive E-learning: Based on the successive approximation model (SAM). *International Journal on E-Learning*, 18(2), 191-204.
- Koszalka, T. A., Russ-Eft, D. F., & Reiser, R. (2013). *Instructional designer competencies: The standards*. IAP.

- Morris, S. (2017). A call for critical instructional design. Retrieved from <https://www.seanmichaelmorris.com/a-call-for-critical-instructional-design/>
- Nichols Hess, A., & Greer, K. (2016). Designing for engagement: Using the ADDIE model to integrate high-impact practices into an online information literacy course. *Communications in information literacy*, 10(2), 6.
- Seel, N. M., Lehmann, T., Blumschein, P., & Podolskiy, O. A. (2017). *Instructional design for learning: Theoretical foundations*. Springer.
- Seels, B. (1989). The instructional design movement in educational technology. *Educational Technology*, 29(5), 11-15.
- Turner, J. (2016). Instructional design: Skills to benefit the library profession. *portal: Libraries and the Academy*, 16(3), 477-489.